March 5, 2008

Selena Medrano
IDEM – TMDL Program
100 N. Senate Avenue
Indianapolis, IN 46204

Re: Busseron Creek Watershed TMDL

Dear Ms. Medrano:

The Indiana Coal Council, Inc. ("ICC") is a trade association representing Indiana's coal producers and related entities. The association was formed to foster, promote, and defend the interests of Indiana's coal industry. Surface coal mining is present throughout southwestern Indiana and many of our members could be affected by implementation of total maximum daily loads ("TMDL") for the Busseron Creek Watershed. For that reason we are providing comments on the draft proposal as follows:

Applicability of TMDLs to Constituents without Water Quality Criteria

Some of the pollutants that IDEM has identified in the draft TMDL do not have promulgated water quality standards. This contradicts the entire TMDL process, which is designed to restore streams that are impaired because they are not meeting *water quality standards*. The Clean Water Act itself addresses this in Section 303(d)(1)(A) by stating:

> "Each State shall establish those waters within its boundaries for which the effluent limitations required by section 301(b)(1)(A) and section 301(b)(1)(B) are not stringent enough to implement any *water quality standard* applicable to such waters."

The applicability of the TMDL process to achieving water quality standards is clarified further in Section 303(d)(1)(C), which states:

> "Each State shall establish for the waters identified in paragraph (1)(A)of this subsection, and in accordance with the priority ranking, the total maximum daily load, for those pollutants which the Administrator identifies under section 304(a)(2) as suitable for such calculation. Such load shall be established at a level necessary to implement the applicable *water quality standards* with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality."

The Clean Water Act clearly intends the TMDL process to apply to pollutants with developed and adopted water quality standards. Water quality standards are developed as a result of the chemical having adverse effects on designated uses, be it human health, aquatic life, agriculture, etc. The derivation of such standards follows scientific methods outlined by the USEPA and again, allows for public input on the development process. Implementing a TMDL on constituents without an adopted water quality standard circumvents the intended purpose of the TMDL program.

USEPA also makes this clear in the document entitled "An Approach for Using Load Duration Curves in Developing TMDLs" (Draft 2006). This document explains that load duration curves are used in the TMDL process to help attain numeric water quality targets. The document states that "Generally, the target is the water quality criterion in the water quality standard for the pollutant of concern." The document further explains that the absence of numeric criteria poses challenges but does provide an option for developing loading capacities without numeric criteria for *sediment* and/or *nutrient criteria*. Nowhere in this guidance does it address developing targets for metals that do not have numeric water quality criterion.

Indiana's 2008 water quality assessment and 303(d) listing methodology for waterbody impairments follows EPA's approach. However, the draft Busseron Creek TMDL has not followed IDEM's own 2008 listing methodology by including iron, manganese, and aluminum in the analysis. With regard to toxicants (metals), the 2008 listing methodology indicates that the toxicants would be judged according to the magnitude of the exceedances of Indiana's water quality standards. This implies that if there is no water quality standard, the constituent is not included in this process.

Furthermore, the draft TMDL contradicts itself in this regard. The streams listed in the Busseron Creek watershed, excluding Sulphur Creek, were listed on the 2006 Section 303(d) list for sulfates, total dissolved solids, dissolved oxygen, and nutrients. However, the draft TMDL has instead targeted impaired biotic communities, iron, aluminum, dissolved oxygen, pH, total suspended solids, and phosphorous. On page 13, the draft TMDL states that the reason for excluding Total Dissolved Solids (TDS) was because Indiana's revised water quality standards no longer contain a water quality criterion for this parameter. However, the draft TMDL has included iron, manganese, aluminum, and phosphorous, which have no water quality standards in this region of Indiana either.

The initial TMDL stakeholder meeting indicated that the TMDL would be specifically targeted at sulfates, copper, zinc, and phosphorous. However, the draft TMDL instead has targeted impaired biotic communities, iron, aluminum, dissolved oxygen, pH, total suspended solids, and phosphorous (excluding Sulphur Creek). The draft TMDL is directed at numerous analytes that never underwent the formal listing process on the Indiana Section 303(d) list. Once the streams were identified as impaired due to the pollutants identified in the draft TMDL, the streams should have been proposed to be added during the next listing cycle. This would ensure that the public had the ability to comment and provide input on the proposed action.

Use of Representative Data

The data quality and quantity used in the impairment determinations is not representative. Overall, the TMDL is primarily based on sampling that was conducted by IDEM between August 22, 2006 and December 12, 2006. This does not span enough time to account for seasonal variation as required by the Clean Water Act. Furthermore, the sampling was conducted during the seasons (summer and fall) that are characterized by low streamflow and higher concentrations of dissolved ions. There was no sampling conducted during the winter and spring when increased precipitation, runoff, and baseflow will tend to lower instream constituent concentrations. This gives a skewed picture of any water quality constituents that may exist in these streams.

Another overarching concern with the data used in TMDL development involves the flow duration curve development. The USGS gauge on Busseron Creek was inactive between December 2, 2003 and May 2, 2007, which includes the time that the water chemistry was sampled. The flow during this time period was estimated from nearby Mill Creek. The draft TMDL says that this is explained in Appendix G, which is not included in the draft. Because the cited Appendix G is not included in the draft TMDL, the accuracy of the streamflow analysis is impossible to assess. It is doubtful that the watershed characteristics and resulting flow regime of Mill Creek can be assumed to accurately depict those of Busseron Creek based on location alone. Because the streamflow data is the foundation for all subsequent TMDL calculations, the validity of all conclusions about stream impairment and maximum loads is questionable. Appendix G should be included with the draft TMDL.

At Busseron Creek Station 5, it is indicated that only one sample (with a duplicate) was taken to make the determination that this segment is impaired with regard to aluminum and iron. One grab sample is insufficient to make a scientifically justified and defensible decision on water quality characteristics. At Big Branch Station 12, it is indicated that only two samples were used to determine impairment for aluminum and iron. Again, this is not enough data to be considered representative of year-round conditions on this stream segment.

At Buttermilk Creek Stations 16 and 17, the draft TMDL lists the sites as impaired due to Total Suspended Solids (TSS). The data that were used to list this segment do not show the specific dates of sampling, although the exceedances appear to have occurred in 2004. Since this time the data indicate attainment of the “target value”. If this is correct, the exceedances occurred more than 3 years ago and should not be used to indicate impairment at present.

At Sulphur Creek Station 1, the TMDL proposes to use metal ions as a surrogate for pH and states that through reducing instream metals, namely aluminum and iron, it is assumed that pH will result in meeting the water quality standards. This is a confusing concept. If metal ions were to be used as a surrogate for pH, it would have to be the dissolved form of metals. The way the TMDL is currently written, the total form of metals is being compared to target values, not the dissolved form. Even then there are

many confounding factors such as effects of groundwater inflow, oxidation and/or speciation of metals that would need to be considered.

The flows for each subwatershed were derived using drainage area ratios as described on page 21. This assumes that the entire watershed has the same runoff characteristics. However, runoff depends predominantly on characteristics such as land use, land cover, and surface gradient, which are not accounted for in this analysis.

Furthermore, it is evident that very little quality assurance / quality control checks were performed on the data. Dissolved aluminum data at Station 11 shows six dates below the detection limit (not listed), two dates measuring 58.6 µg/L and 66.8 µg/L, and one date showing 18,200 µg/L. Unless flow conditions were substantially different during this extreme measurement, it is obvious that it is an outlier and a result of either sampler or laboratory error. The data should undergo rigorous quality assurance and quality control analyses before it is used to make regulatory decisions.

Applicability of the Target Values

The draft TMDL lists target values that were used in the development process. The target values are for total phosphorous, pH, dissolved oxygen, iron, aluminum, total suspended solids, copper, zinc, and manganese. The first issue with these targets is the source and derivation of the targets. IDEM indicated that the iron target was calculated by Dr. Ghias in 1998. However, when asked for any scientific documentation on this target, IDEM did not make this available. It is our understanding that implementation of some of the other listed targets in Indiana NPDES permits has been historically controversial.

The second issue with these targets is that the draft does not indicate the form (total or dissolved) of these targets for iron or manganese. The form of the other target values, although not shown, can be found in the listed reference. Until the form of iron and manganese is presented, the impairment decisions for these elements cannot be evaluated.

The form of the target value is extremely important. First, the dissolved form of these elements more accurately represents the bioavailable fraction to aquatic life. Measuring the total form of these elements tends to overestimate the risk to aquatic life because it accounts for the amount in suspended sediments, which is generally not in a form available to aquatic life. This should be accounted for when determining impairment in a watershed that is predominantly agriculture, which results in increased erosion and suspended sediment instream. In many cases, the monitoring stations no longer show impairment when the dissolved form of the elements is compared to the criterion.

For instance, in Table 18 the Station 5 results listed for aluminum and iron are in the total form as found in Appendix B. As can be seen, the dissolved form of these elements is only a fraction of what is measured in total form. The dissolved iron is only 3.47% of the total and the dissolved aluminum is only 1.27% of the total. More than likely, this is a result of the amount of metals found in the clays and other suspended sediments in the sample and not the fraction available to aquatic life.

Station 9 shows similar fractionation, with dissolved aluminum representing only 7.82% of the total and dissolved iron representing 14.30% of the total. Station 10 is comparable, with dissolved aluminum only 2.64% of the total fraction. Station 11 shows a dissolved aluminum only 2.32% of the total fraction. More than likely, other stations will show this fractionation and should be addressed in the discussion.

Other data used in the TMDL does not indicate whether it is total or dissolved form. This is the case at Buttermilk Creek Stations 16 and 17, where the Appendix does not list the form of aluminum, iron, or manganese.

Excluded Data

In addition to Appendix G mentioned above, additional data is excluded from the draft TMDL. The draft TMDL states that Mud Creek Station 10 shows low DO. First, this data is not included in the TMDL. The data that was received when requested from IDEM shows that the DO averages approximately 10.7 mg/L, with a minimum of 9.23, which is actually a high concentration of DO.

The draft TMDL does not include any flow data to correlate with the water chemistry sample events (DNR or IDEM). There is also no discussion on how the field flow data was measured or estimated. Because this information is necessary to properly evaluate the flow duration curves and determine if the data collected is representative of a range of flow conditions, it should be included in the draft TMDL.

Lastly, Appendix A shows the collected water quality data used in the analysis. For values below the detection limit, an "ND" is listed. However, the detection limits of these analyses are not presented. Furthermore, the values below detection are excluded from all statistical calculations (mean, median, maximum, minimum) in this section giving a misleading picture of the actual water quality.

Assumptions Associated with Inactive Sites

The draft TMDL seems to base waste load allocations on the assumption that inactive sites do not discharge. If this is the case, this is an incorrect assumption for inactive mine sites. Inactive sites may have flow events as a result of precipitation events, streamflow, or groundwater seepage. This applies specifically to the NPDES facilities AML site 931 (ING040200) located on Mud Creek and Farmersburg Bear Run (ING040128) and AML Site 319 (ING040203) on Buttermilk Creek. By assigning these sites a wasteload allocation of zero, the TMDL seems to be stating that these sites cannot discharge. This is infeasible as the dischargers cannot eliminate flows as a result of precipitation events. The definition and implications of a waste load allocation equal to zero need to be made clear with these situations in mind.

Also, there is disagreement in the draft TMDL as to the wasteload allocation assigned to Farmersburg Mine Bear Run (ING040127). On page 32 the draft TMDL assigns this site

a WLA allocation equal to the general permit limits. However, on page 39 the draft TMDL indicates that the WLA allocation equals zero for all pollutants. This needs to be clarified and must take into account that although the site is inactive, it will still discharge as a result of precipitation events.

Issues with Specific Wording of the TMDL

Many areas of the TMDL have inaccurate statements about modern coal mining and are misrepresentative of today's surface coal mines.. Meanwhile, the potential affects of other land uses are completely overlooked or omitted. These areas will be pointed out and appropriate wording suggested in the following section.

On page 1, the draft TMDL states that the Busseron Creek watershed drains approximately 235 square miles of *primarily* forested and agricultural land. When reading the TMDL the focus is directed at mined lands. Indeed, at page 18, the draft TMDL contradicts this fact by stating that a *majority* of the Busseron Creek watershed is covered by abandoned surface and underground mining sites. This statement then refers to figure 5, which does not show mining areas.

On page 19, the TMDL states that the residual effects of pre-law mining have *scarred* the terrestrial landscape of the watershed. This inflammatory language should be removed. The same can be said about deforestation for agriculture across Indiana that occurred throughout the twentieth century involving an area several orders of magnitude greater than mining.

Also on page 19, there is extensive discussion on subsidence altering stream flow and states that "once normally flowing streams dry up as their flow is re-routed underground into a series of old shafts and mining rooms". First, can this be substantiated with any subsidence damage cases in the Busseron Creek watershed? If not, this discussion has no purpose. Second, when streams are subsided, the stream generally only flows through fractures near the surface, and resurfaces downstream of the subsided area. Fractures do not extend the entire distance from the surface to the depths of underground mines.

At pages 22 and 23, The TMDL states that underground and surface mines are prevalent throughout the watershed and are considered the primary sources of the metals. Actually these areas occupy a small area geographically as compared to other land uses. Also, this section is supposed to be focusing on Sulphur Creek Station 1. What is going on "throughout the watershed" is a moot point. Lastly, this is a very broad statement and should not be applied in such a random way. Whereas this may be true with some historic mines and AML sites, it should not be implied that all mines are a major source of metals. Since the onset of the federal Surface Mining Control and Reclamation Act of 1977 ("SMCRA"), best management practices have been employed at all mine sites and are aimed at minimizing adverse affects to the hydrologic balance.

Furthermore, the biological impairments are attributed predominantly to concentrations of these metals (pg. 10), essentially blaming the biological impairments of this watershed

on mining effects. What about the importance of erosion and sedimentation, eutrophication, wastewater discharges, urban runoff, nutrient runoff, and pesticide application? The TMDL overlooks these possible sources of pollution throughout the discussion.

The draft TMDL confuses exceedances of permit limits with violations (pg. 16). The Clean Water Act explicitly allows for exceedances of permit limits, which are generally built in to the calculation of water quality based effluent limitations. Also, this page lists 14 pH violations at Farmersburg Mine Bear Run. The majority of these occurred prior to the mine's current management.

Concluding Remarks

The draft TMDL makes note of the huge reductions needed to achieve the target values but provides no feasible way of achieving these reductions, although it is unclear in the TMDL as to the actual plan to achieve the stated goals.

Many of the previous comments are aimed at the validity of the listed target values, critical data quality issues, errors, and missing information. Until IDEM's stance and explanation on these issues is known and the draft TMDL is truly complete, we cannot finish our analysis and comments on the draft TMDL.

In particular, before we can provide final comments we need information regarding:

1. Appendix G,
2. Justification for the standards derived for iron, manganese, and aluminum and why these are typically not used elsewhere in Indiana,
3. The form (total or dissolved) for the iron and manganese targets,
4. Data that was used to make statements regarding subsidence and pollution in the watershed that was solely attributed to coal mining,
5. Sampling dates where not indicated,
6. Explanation of "zero WLA",
7. Missing TSS data,
8. Missing flow data,
9. Why category 4a, and
10. Scientific justification for the use of only one or two samples to make determinations.

We urge you to provide us the requested information and reopen a comment period, or give us additional informal time to finalize comments after review of the missing information.

Sincerely yours,

J. Nathan Noland